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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,551	11/28/2003	Masahiko Kawabata	246037US2	8358

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EXAMINER	
WALLENHORST, MAUREEN	
ART UNIT	PAPER NUMBER
1743	

DATE MAILED: 11/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/722,551	KAWABATA ET AL.	
	Examiner	Art Unit	
	Maureen M. Wallenhorst	1743	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-8 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-8 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 2/24/04, 6/15/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The preamble of claim 1 is indefinite since it is not clear what about a lubricated portion is being diagnosed. The wear? On line 4 of claim 1, the phrase "large-diameter metal" is indefinite since it is not clear what constitutes "large". There is no comparative basis for what "large" means. See these same problems in claim 5.

On line 8 of claim 5, the phrase "and a filtrate" is indefinite since it is not clear whether this phrase means that the large-diameter metal particle is dissolved in a solution that contains both an acid and a filtrate, or whether it means that the metal concentration is measured in the filtrate separate from the solution of the large-diameter metal particle. It is suggested to insert the number (1) on line 7 of claim 5 before the phrase "a solution", and the number (2) on line 8 before the phrase "a filtrate" so as to make it clear that the metal concentration is measured in both the solution of the large-diameter particle and in the filtrate.

On line 12 of claim 6, the phrase "diagnosis the state" should be changed to –diagnoses the state—so as to make proper sense.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1, 3-5 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guymer (US Patent no. 3,981,584, submitted in the Information Disclosure Statement filed on June 15, 2004) in view of Anderson (US Patent no. 5,408,306) and Kauffman et al (US Patent no. 4,448,887, also submitted in the IDS filed on June 15, 2004).

Guymer teaches of a method and a system for predicting and diagnosing the wear of a lubricating portion in an engine. The wear is caused by metal contaminants that enter into a lubricating oil used to lubricate moving portions in the engine. The metal particle contaminants range in size from several microns to a small fraction of a micron. As the wear in a lubricating portion of an engine becomes more severe, the metal particle contaminants become larger. The

method taught by Guymer comprises the steps of collecting a sample of lubricating oil taken from a lubricating portion of an engine, passing the oil through various filters having different pore sizes such as 1.2 micron or 0.3 micron to separate metal particles of various sizes, collecting the filtrate fractions resulting from the filtrations, and analyzing the various filtrate fractions having different size metal particles therein by emission spectrometry. The content of the metal contaminants for each of the fractions is plotted against the particle size as a display of the results. From the display, one can diagnose whether the lubricating portion of the engine from which the oil sample is taken is approaching a failure condition based upon the number of larger metal particles present in the oil. See lines 1-48 in column 1, lines 25-68 in column 2, lines 14-35 in column 3 and lines 1-40 in column 4 of Guymer. Guymer fails to teach that the total concentration of metal particles, both large and small, in the collected oil sample is calculated by measuring the amount of metals in the large particles filtered out of the oil sample by dissolving the large filtered particles with an acid followed by spectrometric analysis, and then adding this value to the concentration of metal particles measured in the filtrate samples.

Anderson teaches of a method for the spectrometric analysis of metals in a lubricating oil used to lubricate a portion in a piece of equipment. The method detects and quantifies both small metal particle contaminants and large metal particle contaminants to give a total, more accurate measure of the metal content of a lubricating oil obtained from a lubricating portion. The method comprises passing an oil sample obtained from a lubricating portion through a filter 14 in order to filter out large metal particles from the oil. The filter is porous and filters particles of approximately one micrometer and larger from the oil sample. Emission spectroscopy using an inductively coupled plasma is then performed on the large metal particles separated on the filter.

The results of such measurement are combined with the results of conventional emission spectroscopy for dissolved fine, small particles in the oil sample in order to obtain a complete, total wear analysis for an equipment of interest, and to obtain a total elemental content of the oil. See lines 50-68 in column 2, liens 1-37 in column 3, lines 1-60 in column 4, lines 30-40 in column 5 and lines 13-20 in column 7 of Anderson.

Kauffman et al teach of a method for the spectrometric particle size determination of metal particles in a lubricating oil sample in order to determine the quantity of large and small wear metal particles therein that contribute to the wear and failure of a lubricating portion in a machine. The method comprises combining a sample of an oil from a lubricating portion with a mixture of acids in order to dissolve large metal particles therein, and thereafter, analyzing the sample using a spectrometric apparatus such as an inductively coupled plasma emission spectrometer. The dissolving of the large diameter metal particles allows such particles to be measured spectrometrically in addition to the smaller metal particles so that a total, accurate measure of all metal contaminant particles in the oil sample is obtained. See lines 65-68 in column 1, lines 1-16 in column 2 and lines 23-50 in column 3 of Kauffman et al.

Based upon the combination of Guymer, Anderson and Kauffman et al, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to measure the total concentration of metal particles, both large and small, in the collected oil sample taught by Guyer by measuring the amount of metals in the large particles filtered out of the oil sample by dissolving the large filtered particles with an acid followed by spectrometric analysis, and then adding this value to the concentration of smaller metal particles measured in the filtrate samples obtained in the method of Guyer, since both Anderson and Kauffman et al teach that in order to

obtain an accurate and complete, total wear analysis for an equipment of interest, a total elemental content of the metals present in both large and small diameter particles present in the lubricating oil must be measured, and Kauffman et al teach that in order to accurately measure the concentration of metals in the large particles using emission spectrometry, the large metal particles should be dissolved first in an acid in order to break the large particles apart.

6. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guyer in view of Anderson and Kauffman et al as applied to claims 1, 3-5 and 7-8 above, and further in view of Applicants' admitted prior art on page 1 of the specification. For a teaching of Guyer, Anderson and Kauffman et al, see previous paragraphs in this Office action. Guyer, Anderson and Kauffman et al fail to teach that the wear depth of a lubricated portion in a piece of machinery or equipment is diagnosed based upon a rate of change in the wear depth in accordance with a time elapse.

Applicants admit on page 1 of the specification that a known method for diagnosing a lubricated portion, known as the SOAP method (spectrometric oil analysis program), comprises the steps of diluting a lubricating oil picked up from the lubricated portion with an organic solvent, exciting a metal particle in the oil by a plasma so as to emit light, measuring the wavelength and strength of an atomic spectrum line obtained by separating the light so as to measure the metal concentration, and diagnosing the state of the lubricated portion on the basis of the rate of change of the metal concentration in accordance with a time elapse. See page 1 of Applicants' specification in the section under the heading "Description of the Prior Art".

Based upon the combination of Guyer, Anderson, Kauffman et al and Applicants' admitted prior art, it would have been obvious to one of ordinary skill in the art at the time of the

instant invention to diagnose the wear depth of the lubricated portion taught by Guyer based upon a rate of change in the wear depth in accordance with a time elapse since Applicants admit that such a step is known in the prior art in order to determine how the wear of a lubricated portion changes over time so that the lubricating portion can be serviced or replaced as needed.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Please make note of: Stone et al, Freese, V et al, Cheiky-Zelina, Hutchinson, Luria and Packer et al who all teach of different methods of analyzing metal particles in lubricating oils.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen M. Wallenhorst whose telephone number is 571-272-1266. The examiner can normally be reached on Monday-Thursday from 6:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden, can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Maureen M. Wallenhorst
Primary Examiner
Art Unit 1743

mmw

November 9, 2006

Maureen M. Wallenhorst
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